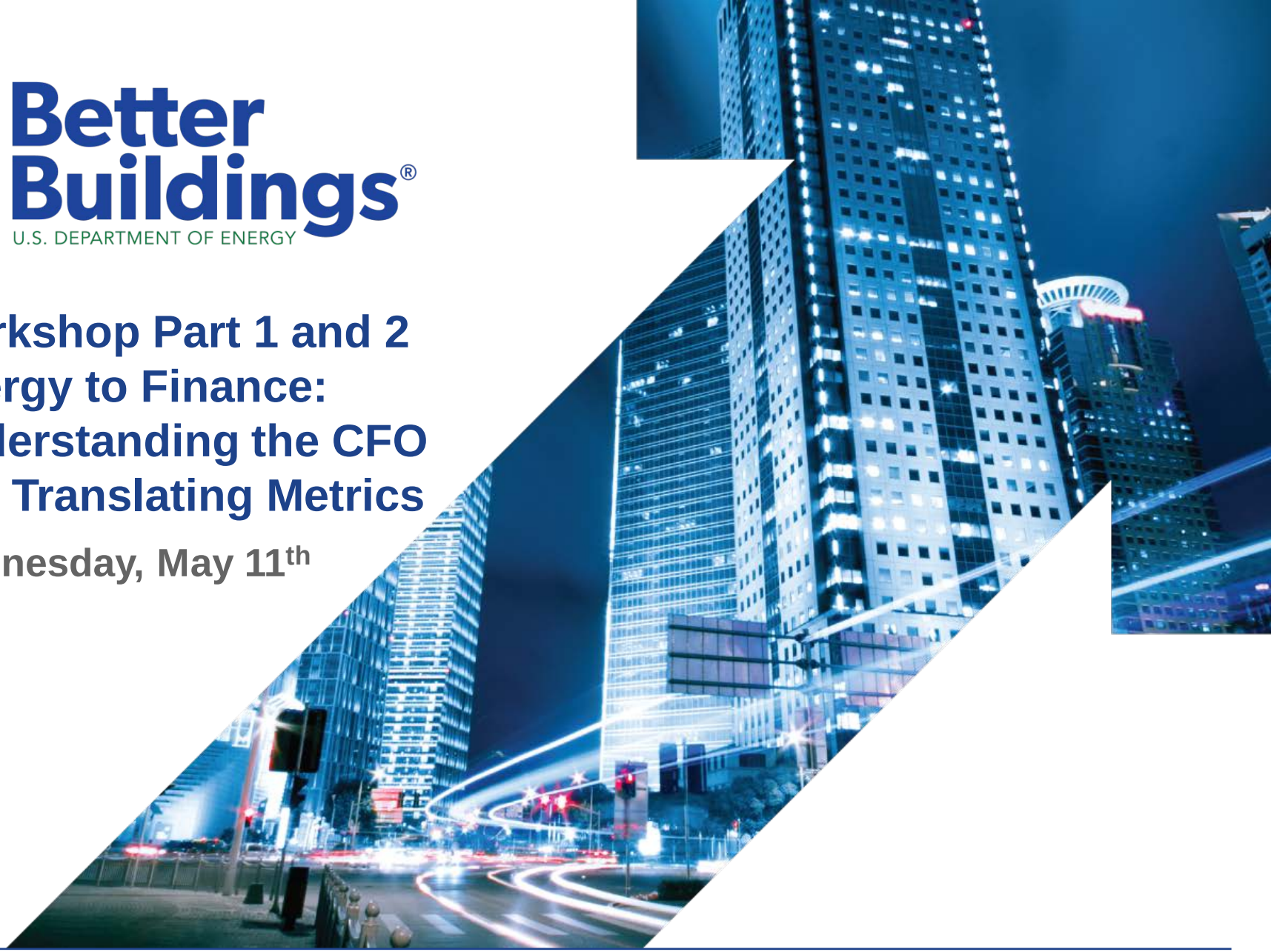
Better Buildings®
U.S. DEPARTMENT OF ENERGY

Workshop Part 1 and 2 Energy to Finance: Understanding the CFO and Translating Metrics

Wednesday, May 11th



U.S. DEPARTMENT OF ENERGY

2016 RILA Workshop

Energy to Finance:

Understanding the CFO and Translating Metrics

May 11, 2016

Created by:

Deloitte.

This resource was completed with support from the Department of Energy's Office of Energy Efficiency and Renewable Energy and the Better Buildings Initiative to highlight innovative proven energy solutions from market leaders in the Retail sector. Find more ideas at the Better Buildings Solution Center at betterbuildingssolutioncenter.energy.gov

Welcome

Erin Hiatt, RILA

Washington, D.C. Workshop Agenda

May 11, 2016

Welcome Erin Hiatt, RILA	**9:45 am**
Introductions • Group Introduction & Session Expectations • Chatham House Rules	**9:50 am**
Thinking Like a Finance Professional	**10:00 am**
Teaming with the Finance Organization: • Enterprise Decision Making • Financial Measurement	**10:15 am**
Case Study 1: Doing the Math Together	**10:30 am**
Break	**11:00 am**
Case Study 1: Debrief	**11:15 am**
Case Study 2	**11:30 am**
Your Examples: Applying the Finance Concepts	**12:00 pm**
Wrap Up & Next Steps – Feedback Survey Erin Hiatt, RILA	**12:20 pm**

Introductions

What do you most hope to learn in today's workshop?

Today's Presenters

Josh Mellinger
Deloitte Consulting LLP
Social Impact
Sustainability

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(713) 828-6036

Josh Mellinger is a Manager with the Strategy & Operations practice. He has 10 years of experience in the energy industry, including roles in strategy, supply chain, energy technology, portfolio analysis, project finance, regulatory relations, and cleantech venture capital.

His previous client work has included energy management, green IT, solar, wind, electric vehicles, batteries/super capacitors, smart grid applications, and demand response/energy efficiency technologies.

Josh's current focus area is the deployment of transformative sustainability strategies and the implementation of advanced energy analytics solutions.

Martha Fung
Deloitte Consulting LLP
Strategy & Operations
Finance

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(202) 465-0866

Martha has 11 years of experience advising CFOs and other Finance Executives through complex financial transformations to solve strategy, regulatory, process, operational, and change management issues. Martha has a wide breath of experience across numerous industries, including energy-power and utilities, Federal government, non-profit, financial services, manufacturing, and higher education.

Martha has significant experience restructuring finance operations, designing budgeting processes, and enhancing the financial planning and analysis functions. Martha is a thought leader within Deloitte's global Finance Transformation (FT) and Energy practice. She is also a seasoned Finance Lab and workshop facilitator, mobilizing Finance Executives on a prioritized path forward.

Objectives

1. **Understand why sustainability matters for CFOs**
2. **Discuss the Finance organization's key activities**
3. **Review key metrics CFOs use to evaluate project proposals**
4. **Communicate effectively with the Finance organization**

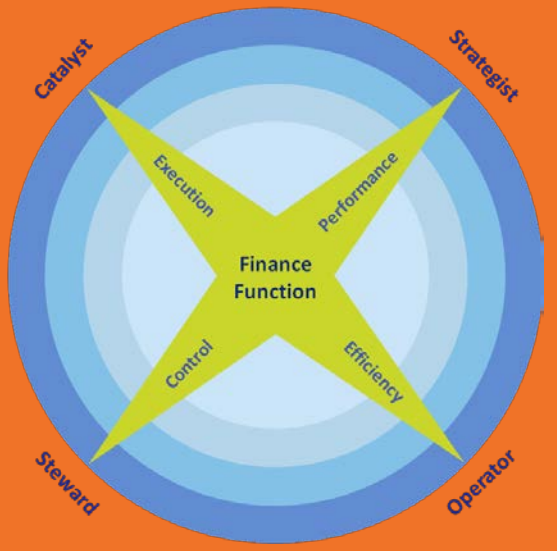
Sustainability Matters

Multiple groups of stakeholders are looking at sustainability; your role can help make sure initiatives are successful

Companies have moved beyond compliance & now sustainability must drive value. In one case, a company found over $790M in value creation opportunities from sustainability.

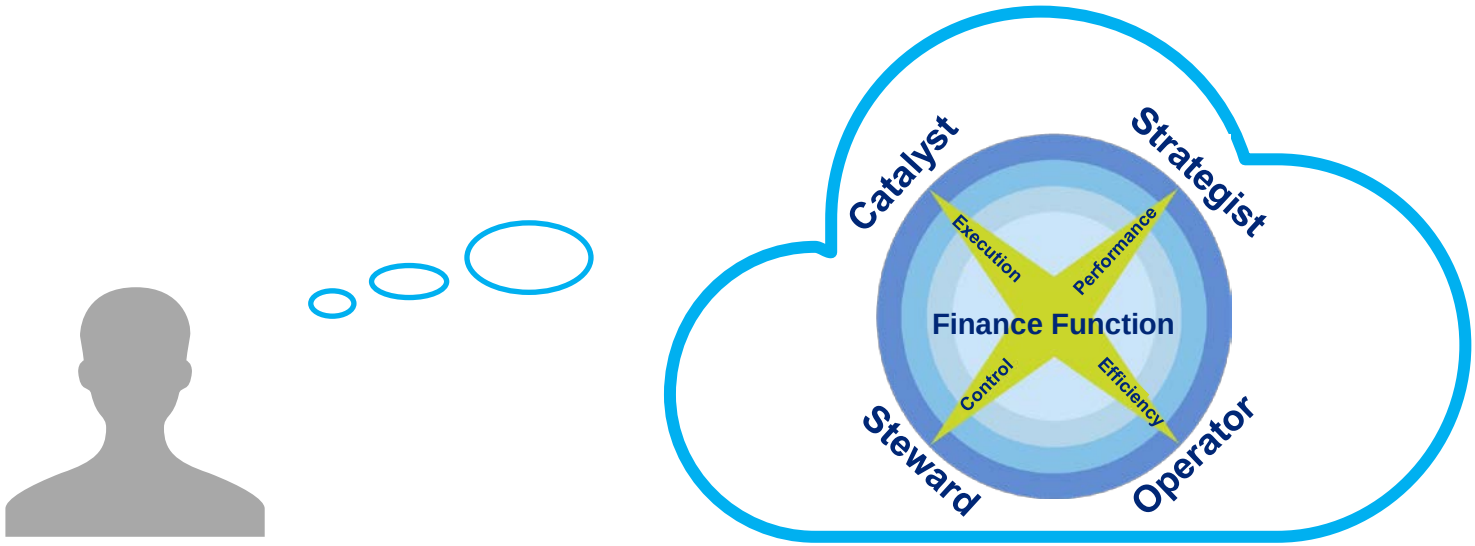
To be successful in driving sustainability you have to be able to talk to the Finance group & communicate the value & impact of your initiatives from a financial perspective

Thinking Like a Finance Professional



The role of the CFO

Traditionally viewed as a financial gatekeeper, the role of the CFO has expanded & evolved to a strategic partner & advisor to the CEO

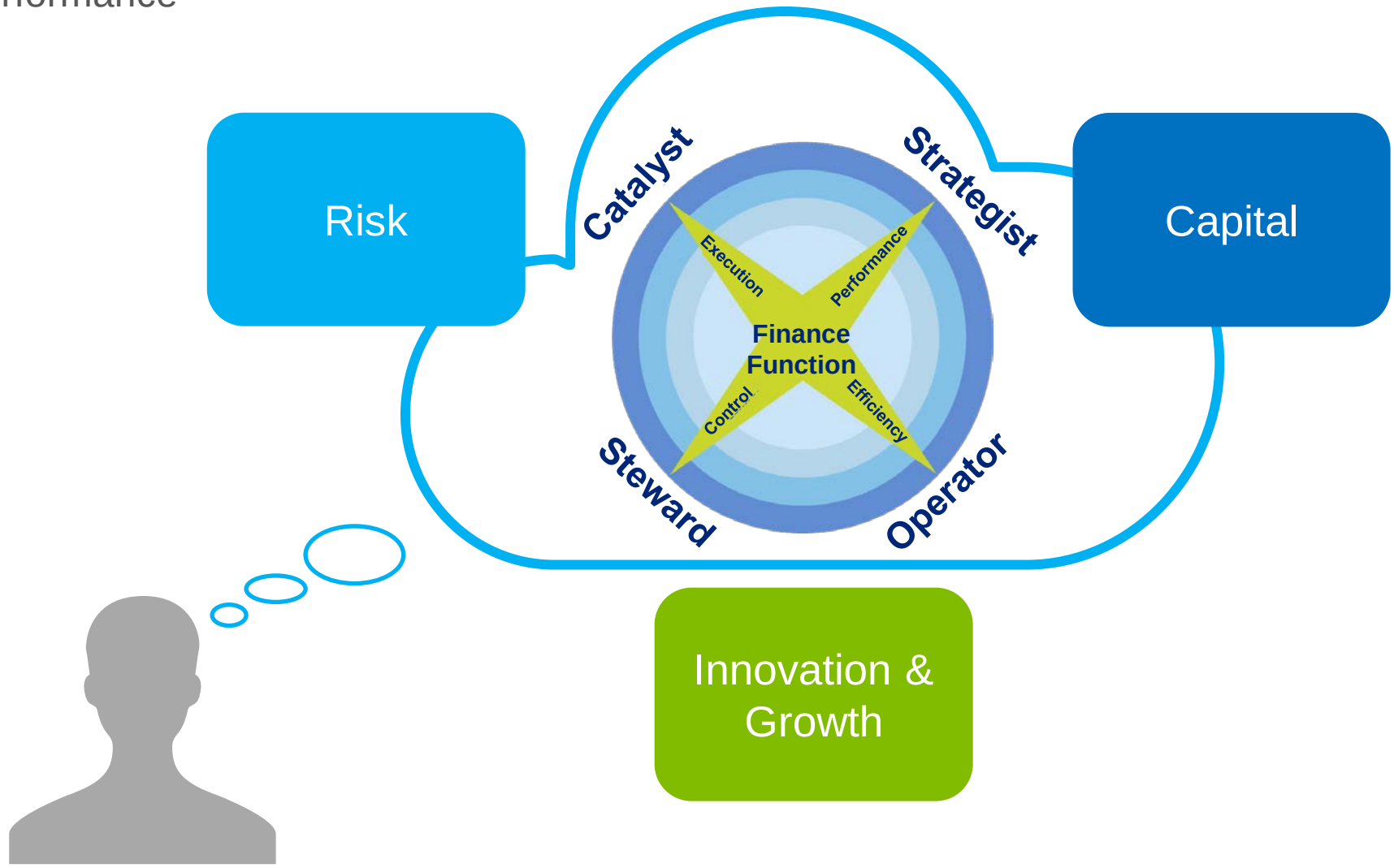


Role **Responsibilities**

Strategist: Performance	Increase value for shareholders; drive innovation & growth; plan & execute financial goals
Operator: Efficiency	Manage the efficiency & effectiveness of the Finance organization
Steward: Control	Manage risk exposure, control costs & invest capital wisely; report financial results
Catalyst: Execution	Identify, evaluate & execute business strategies; serve as a business partner to others

What does Finance care most about given its roles?

The CFO's primary goal is to manage risk while creating value & improving performance



Does energy efficiency align with the CFO's role?

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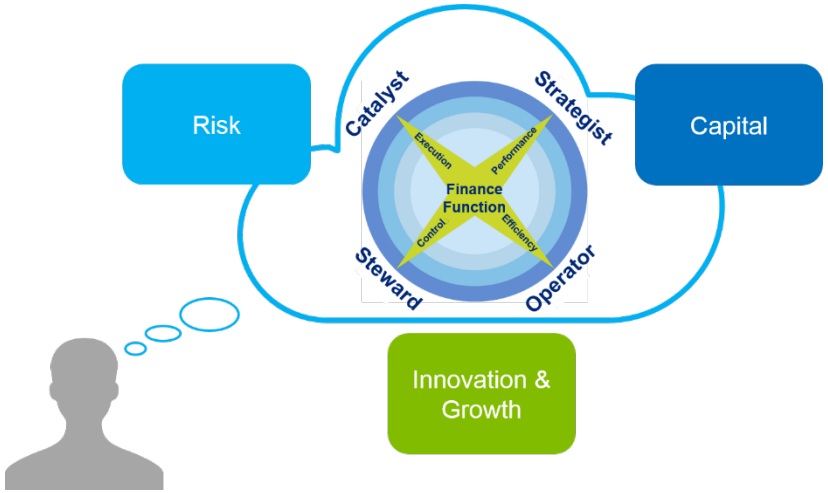
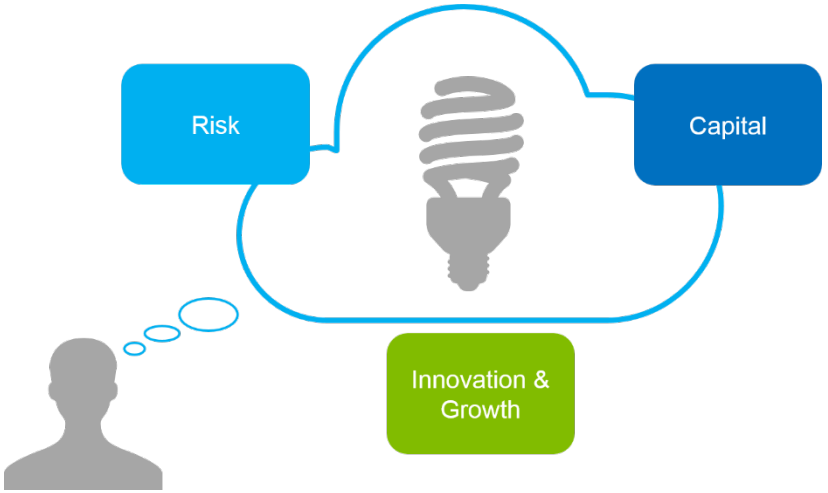
CFOs & energy managers share goals related to risk, capital & innovation & growth

The **CFOs** primary goal is to manage risk while creating value & improving performance



The **Energy Managers** primary goal is to manage risk while creating value & improving performance!



Role	CFOs	Energy Managers
Innovation & Growth	Drive profitable growth through capital investment balancing the long-term strategy with near-term pressures	Drive growth by creating new customer relationships as well as inspiring new products & business models
Risk	Assess & mitigate financial and operational risks using data-backed insights	Enable better risk management by providing greater visibility into potential exposures including: energy price volatility, regulations, supply chain disruptions, reputational damage
Capital	Deploy capital productively & prioritize projects with higher than average returns; grow business with minimal additional risk.	Increase capital productivity by reducing costs, optimizing the supply chain, & increasing employee productivity

Teaming with the Finance Organization:

Planning, Budgeting, Forecasting, & Performance Management

Finance Framework: Creating Shareholder Value

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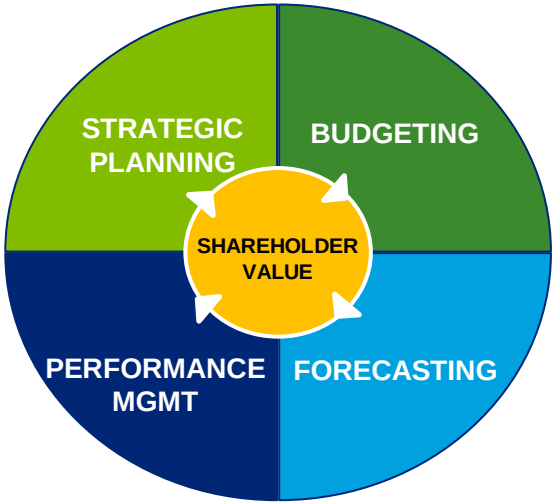
Understanding Enterprise Wide Decision Making

Objectives	• Leadership's main objective is to drive & maximize shareholder value • Leveraging the value drivers (product innovation, design & development, growth, cost reductions, strategic investing & management of risks) can increase shareholder value
Measuring, Deciding, & Monitoring	• Strategic planning, budgeting, forecasting, & performance management are tools that leadership uses to measure, prioritize, & monitor projects/initiatives • The "Decision Making Framework" helps visualize the decision making process, centered around shareholder value

Decision Making Framework



Strategic Planning: *Where do we want to go?*

- Understanding the corporate vision, mission, & desired path forward; strategic planning aligns the business strategy & growth plans to financial measures & targets

Budgeting: *How do we get there?*

- The allocation & optimization of resources that enable strategic objectives & growth plans to be met while understanding key value drivers of income & costs

Forecasting: *How can we be better?*

- The set of target numbers for relevant performance metrics, predicted for a fixed time period in the future

Performance Management: *How are we progressing?*

- Allows business to track, evaluate, & measure value against targets that capture the business' goals & growth objectives

Aligning Initiative to Shareholder Value

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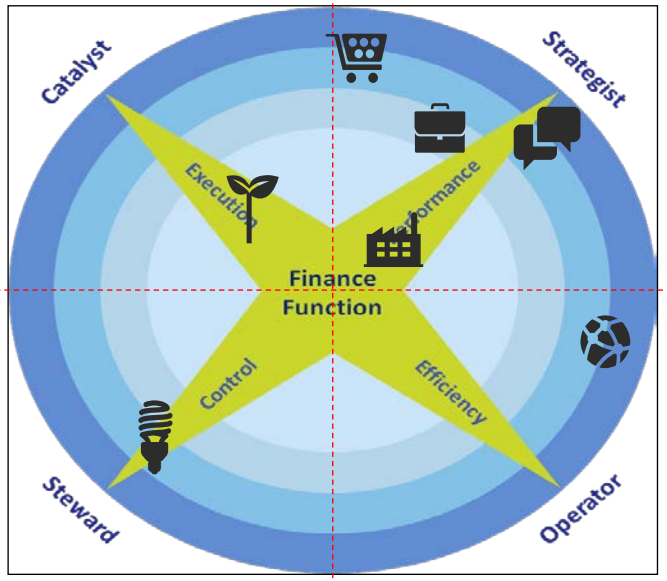
Identify Initiative's Value Driver → ***Understand How Initiative Fits Into CFO's Role & Duties*** → ***Understand How Finance Will Value & Measure***

Value Driver

- Product Innovation & Design / Development
- Marketing & Communication
- Production
- Indirect Procurement
- Logistics & Distribution
- Account Management
- Offices & Retail

CFO's Four Faces



Decision-Making Framework

Value to Finance

Cost Reductions	Reputational Goodwill	Growth	Compliance	Employee Engagement
Risk Management	Accountability	Market Perception	Cost Control	Return on Investment

Performance Management: Measurement

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Performance Management

Performance Management Overview

- Allows business to track, evaluate, & measure value against targets based on the business goals & growth objectives
- Understanding the metrics, calculation, & application allows for better alignment of sustainability initiatives or projects
- Regularly measuring & communicating the performance of sustainability initiatives will highlight the positive financial impact

Analytical Ratios

	Hurdle Rate	Discounted Payback Period	Net Present Value (NPV)	Internal Rate of Return (IRR)	Benefit-to-Cost	Economic Margin
Use Case	When attempting to set a consistent, minimum threshold to compare projects	When attempting to efficiently compare similar investments based on the time it takes to return the initial investment	When comparing projects of similar size on a future cash flow basis	When comparing the profitability of projects of different sizes on a percentage basis	When ranking projects to understand where the "biggest bang for the buck" can be achieved	When comparing projects with isolated benefits & attempting to evaluate incremental impact on firm value

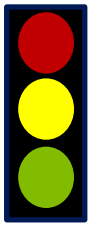
Increasing Level of Sophistication

Key Performance Indicators (KPIs)

KPIs are developed based on the input of key measures of "what matters" relative to business goals & growth objectives

Key Performance Indicator

- Cost of Capital
- Internal Rate of Return (IRR)
- Net Present Value (NPV)
- Return on Investment (ROI)



Potential Actions & Conclusions

- Changes are required as performance for a certain metric is below desired thresholds
- Metric is not performing as intended; may required changes & assessments
- Metric performance is within desired target range

Measurement: Return on Investment

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Definition	A ratio to measure the benefit of the investment of capital. ROI is a measure of efficiency that can be used to compare multiple projects.
Analysis	• Inputs: Gain on investment; cost of investment • A high ROI means that the project has favorable returns as compared to the required capital investment

Example:

Project A costs $500,000 and has a total gain of $600,000. What is the project's ROI?

Formula:

$$\frac{\text{(Gain from investment – Cost of investment)}}{\text{Cost of Investment}}$$

$$\frac{600{,}000 - 500{,}000}{500{,}000} = \mathbf{20\%}$$

Measurement: Hurdle Rate

Definition	The **minimum rate of return** that a project must earn in order to be funded. The rate of return earned by projects with similar risk.
Analysis	• Calculated based on the company's **cost of capital** • High risk projects have **high** hurdle rates • **Project IRR > = to Hurdle Rate**

Example:

A company's hurdle rate is 10%. Which projects would be considered to be funded?

Project B: IRR = 8%

Project C: IRR = 10%

Project D: IRR = 12%

Measurement: Payback Period

Definition	The amount of time before the **cash inflows repay the initial investment.** The discounted payback period adjusts the cash inflows for the time value of money (a dollar is worth more now than a year from now).

Analysis	• Inputs: cash inflows and cash outflows
	• Shorter payback periods are preferred
	  • Less risk
	  • Recovered costs are available to invest in new projects sooner

Example:

Project E cost $200,000 in year 1. The cash inflows from Project E are expected to be $100,000 each year for 3 years. What is the payback period?

	Year 1	Year 2	Year 3
Cash inflow	$100,000	$100,000	$100,000
Cash outflow	($200,000)	$0	$0

Measurement: Net Present Value (1 of 3)

Definition	The sum of the discounted value of all cash inflows less all cash outflows.

Analysis	• Inputs: initial investment, cash inflows, cash outflows, discount rate
	• Higher NPV's are preferred
	  • Less risk; greater return
	  • Projects with NPV's < 0 should not be considered

Example:

Project F has $150,000 cost today and has a 10% cost of capital. The cash inflows from Project F are expected to be $100,000 for 3 years. The annual cash outflow each year is $25,000. What is the NPV of the investment?

	Year 0 (Now)	Year 1	Year 2	Year 3
Cash inflow		$100,000	$100,000	$100,000
Cash outflow	($150,000)	($25,000)	($25,000)	($25,000)
Net Cash Flows	**($150,000)**	**$75,000**	**$75,000**	**$75,000**

Measurement: Net Present Value (2 of 3)

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Step 1: Identify Cash Flows

	Year 0 (Now)	Year 1	Year 2	Year 3
Cash inflow		$100,000	$100,000	$100,000
Cash outflow	($150,000)	($25,000)	($25,000)	($25,000)
Net Cash Flows	**($150,000)**	**$75,000**	**$75,000**	**$75,000**

Step 2: Discount Cash Flows

Formula:

$$\frac{\text{Net Cash Flow}}{(1+\text{discount rate})^{\wedge}\text{year}}$$

Year 1 Example:

$$\frac{\$75{,}000}{(1+.1)^{\wedge}1}$$

	Year 0 (Now)	Year 1	Year 2	Year 3
Net Cash Flows	($150,000)	$75,000	$75,000	$75,000
Present Value	**($150,000)**	**$68,182**	**$61,983**	**$56,349**

Measurement: Net Present Value (3 of 3)

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Step 3: Sum Discounted Cash Flows

	Year 0 (Now)	Year 1	Year 2	Year 3	Total
Present Value	**($150,000)**	**$68,182**	**$61,983**	**$56,349**	**$36,514**

Step 4: Conclude on NPV

The NPV for this project is positive. If it is greater than NPV's of similar projects (with comparable risk), **management should pursue this project**.

Measurement: Internal Rate of Return (IRR)

Definition	The discount rate at which the NPV equals zero.
Analysis	• Iterative process of inputting interest rates • Measure to compare projects of different sizes

Example:

Project G costs $150,000 now and has a 10% hurdle rate. The cash inflows from Project G are expected to be $100,000 for 3 years. The annual cash outflow each year is $25,000. What is the IRR of the investment?

	Year 0 (Now)	Year 1	Year 2	Year 3
Cash inflow		$100,000	$100,000	$100,000
Cash outflow	($150,000)	($25,000)	($25,000)	($25,000)
Net Cash Flows	**($150,000)**	**$75,000**	**$75,000**	**$75,000**

Measurement: IRR (2 of 2)

Calculate NPV with different discount rates until you obtain a value of zero:

Discount Rate	NPV
20%	$7,986
23%	$853
24%	($1,402)
25%	($3,600)
30%	($13,792)

The IRR falls between 23% and 24%. Further iteration results in an IRR of approximately **23.4%. The IRR is greater than the hurdle rate of 10%.**

This value can be compared to other projects of difference sizes to gauge relative returns. If it is greater than IRR's of similar projects (with comparable risk), **management should pursue this project**.

Case Study 1

Framing the Conversation: Types of Analyses

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Portfolio

- What types of projects does the company want to consider for its portfolio?
- Where and how does the company currently use its energy
- How are projects prioritized within the portfolio?
- Where does my proposal fit into this portfolio?

Project

- What is the business case for the proposed project?
- What energy savings or cost reductions am I looking to create for the company?
- What credits exist from regulators for pursuing reductions in resource usage?

Target

- What are the determined targets that my project must achieve (financial metrics, energy reduction/carbon efficiency)?
- What financial savings can be realized?
- What intangible benefits can be quantified?

Case Study Exercise: Objectives

The objective of this case study is for each participant to ***understand and practice***:

- How to calculate Return on Investment, Payback Period, and Net Present Value
- How to evaluate qualitative factors influencing scale / impact, location and the marketplace, and strategic priorities
- The importance of presenting your investment case to Finance using both financial metrics and qualitative factors

Case Study Exercise: Checklist

To successfully complete this case study, each table group should ***do the following***:

Review the Case Study Facts — *5 min*
Discuss prompt and clarifying questions

Perform Financial Analysis — *5 min*
Complete a financial analysis given case facts to formulate a recommendation to management

Perform Qualitative Analysis — *5 min*
Discuss relevant qualitative factors to supplement the recommendation to management (brand perception, etc.)

Prepare Recommendation to Management — *5 min*
Synthesize quantitative and qualitative factors to present a final recommendation to Finance

Case Study: Case Facts

Company XYZ is a large clothing retailer with operations throughout the U.S. Its brand portfolio consists of 3 brands: a premium brand (A), a mid-tier brand (B) and value brand (C). Although all 3 brands are distributed nationally, the demand for each brand highly correlates with regional locations. Company XYZ merchandises its assortment by geographic region and season.

Renewable Energy investments represent a feasible option for Company XYZ to reduce its environmental impact and meet sustainability goals thus has become a top priority for its stakeholders.

Selecting optimal investments will allow Company XYZ to maximize environmental impact, while maintaining an appropriate level of financial return. Solar is the most widely applicable technology for Company XYZ's current facility portfolio but should be augmented with additional sustainability projects where financially feasible.

Company XYZ is considering investing in solar power and must determine its pilot location. The new CEO is hoping to improve green house gas emissions by 10% over five years. Company XYZ has a cost of capital of 10%.

Company XYZ: Location Analysis

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Location 1: Sunshine Valley

- Flagship store, open for 5 years
- Product mix is primarily Brand A with some of Brand B's most popular assortment
- Energy costs are very high and a 10% cost reduction could be achieved through a solar project
- The customer base highly values renewable energy initiatives
- The project requires a $100M upfront investment and expects net cash inflows as follows: year 1-2: $40M per year; year 3: $25M; year 4-5: $10M per year
- The project would qualify for state renewable energy credit equal to $1.5M per year (already included in cash flow)
- The project would contribute 5% towards the CEO's greenhouse gas emissions goals

Location 2: Midwestern Plains

- New store to be built
- Product mix is primarily Brand B with some of Brand A and C included each season
- Energy costs are moderate and a 3% cost reduction could be achieved through a solar project
- The customer base is not passionate about solar energy. However, there is a strong city contingent promoting renewable energy sources, even supporting an accelerated store opening
- The project requires a $90M upfront investment and expects consistent net cash inflows of $25M over 5 years
- The project would qualify for state renewable energy credit equal to $1M per year (already included in cash flow)
- The project would contribute 2% towards the CEO's greenhouse gas goals

Success Criteria for Renewable Energy Projects

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The following attributes determine the overall success of renewable energy projects and should be appropriately weighted to meet Company XYZ's sustainability goals:

Profitability

Establishes the initial financial feasibility of new generation at Company XYZ's locations

Key attributes

↑ High retail cost of electricity

↓ Low cost of renewable energy generation

↑ Favorable investment incentives and credits

Scale / Impact

Ensures new generation provides adequate scale to make a significant impact

Key attributes

↑ High emissions

↑ High energy usage

↑ High carbon density

Location / Market

Provides basis for generation type and ownership models available

Key attributes

↑ High renewable resource availability

↑ High access to renewable energy markets

↓ Low cost of capital

Non Financial / Strategic

Incorporates additional measures that may provide value beyond cost / benefit analyses

Key attributes

↑ High visibility

↑ High environmental brand association

↑ High implementation feasibility

Case Study: Quantitative Analysis - ROI

$$ROI = \frac{(\text{Gain from investment} - \text{Cost of investment})}{\text{Cost of Investment}}$$

Location 1: Sunshine Valley

$$\frac{125M - 100M}{100M} = \mathbf{25\%}$$

Location 2: Midwestern Plains

$$\frac{125M - 90M}{90M} = \mathbf{39\%}$$

Case Study: Quantitative Analysis – Payback

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Location 1: Sunshine Valley

	Outflow	Inflow
Investment	($100M)	
Year 1		$40M
Year 2		$40M
Year 3		$25M
Year 4		$10M
Year 5		$10M

Location 2: Midwestern Plains

	Outflow	Inflow
Investment	($90M)	
Year 1		$25M
Year 2		$25M
Year 3		$25M
Year 4		$25M
Year 5		$25M

Case Study: Quantitative Analysis – NPV

$$\text{Present Value} = \frac{\text{Net Cash Flow}}{(1+\text{discount rate})^{\wedge}\text{year}}$$

Location 1: Sunshine Valley

	Year 0 (Now)	Year 1	Year 2	Year 3	Year 4	Year 5
Net Cash Flows	($100M)	$40M	$40M	$25M	$10M	$10M
Present Value	**($100M)**	**$36M**	**$33M**	**$19M**	**$7M**	**$6M**
NPV	**$1.2M**					

Case Study: Quantitative Analysis – NPV

$$\text{Present Value} = \frac{\text{Net Cash Flow}}{(1+\text{discount rate})^{\wedge}\text{year}}$$

Location 2: Midwestern Plains

	Year 0 (Now)	Year 1	Year 2	Year 3	Year 4	Year 5
Net Cash Flows	($90M)	$25M	$25M	$25M	$25M	$25M
Present Value	**($90M)**	**$23M**	**$21M**	**$19M**	**$17M**	**$16M**
NPV	**$4.8M**					

Case Study: Quantitative Analysis – Summary

Discuss how you would prioritize and weigh the quantitative considerations.

Metric	Location 1: Sunshine Valley	Location 2: Midwestern Plains
ROI	25%	**39%**
Payback Period	**3 years**	4 years
Net Present Value	$1.2M	**$4.8M**

Case Study: Recommendation

- Which solar location would you present to management?
- What are key factors for picking your solar location?
- What are key metrics to highlight to make a strong case?
- What are qualitative factors that support the location choice?
- What else needs to be done to achieve the CEO's 10% target?
- How would you continue to build your sustainability portfolio?

Case Study 2

Framing the Conversation: Types of Analyses

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Portfolio

- What types of projects does the company want to consider for its portfolio?
- Where and how does the company currently use its energy
- How are projects prioritized within the portfolio?
- Where does my proposal fit into this portfolio?

Project

- What is the business case for the proposed project?
- What energy savings or cost reductions am I looking to create for the company?
- What credits exist from regulators for pursuing reductions in resource usage?

Target

- What are the determined targets that my project must achieve (financial metrics, energy reduction/carbon efficiency)?
- What financial savings can be realized?
- What intangible benefits can be quantified?

Case Study Exercise: Objectives

The objective of this case study is for each participant to ***understand and practice***:

- ❑ How to identify and calculate potential Cost Savings
- ❑ How to evaluate qualitative factors influencing energy reductions and alignment between sustainability strategy and corporate strategy
- ❑ How to assess a portfolio of potential sustainability initiatives
- ❑ The importance of aligning stakeholders across the enterprise

Case Study Exercise: Checklist

To successfully complete this case study, each table group should ***do the following***:

Review the Case Study Facts — *5 min*
Discuss prompt and clarifying questions

Perform Financial Analysis — *5 min*
Complete a financial analysis given case facts to formulate a recommendation to management

Perform Qualitative Analysis — *5 min*
Discuss relevant qualitative factors to supplement the recommendation to management (brand perception, etc.)

Prepare Recommendation to Management — *5 min*
Synthesize quantitative and qualitative factors to present a final recommendation to Finance

Case Study: Case Facts

A big box retailer, Company ABC, is looking to drive increased energy efficiency throughout its value chain. Company ABC currently operates 4 main segments: corporate, production, distribution and retail operations.

The company's sustainability organization has performed an initial analysis on the organization's historic energy usage to formulate a set of recommendations. These recommendations created the baseline for the sustainability organization's annual strategy.

The sustainability organization's annual strategy centers around a portfolio of energy efficiency projects over the next 3 years. However, this analysis has not yet been reviewed by the finance department (responsible to deploy capital) or been aligned with the overall corporate strategy.

Review the analysis completed and frame a proposal

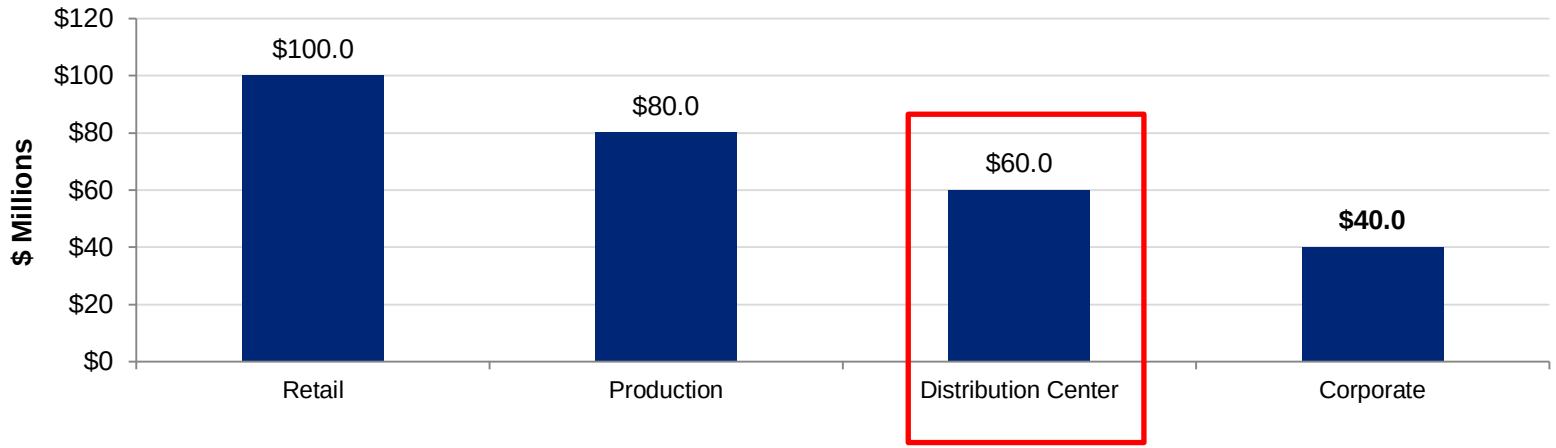
How do you position your proposal effectively given that several business units are competing for the same funding?

What steps would you take to align the sustainability strategy with the corporate strategy?

How would you address the finance organization?

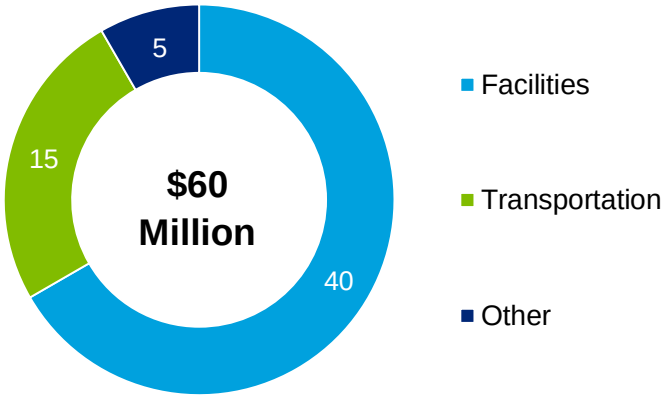
Company ABC: Energy Expenditure Analysis

2014 Total Energy Expenditures by Division



Based on a historical analysis, it was determined that the distribution division has the largest addressable energy spend.

2014 Distribution Expenditures by Type



Facilities includes expenditures in Warehouse and Office categories

Company ABC: Energy Expenditure Analysis

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Key Analysis Findings

- Distribution division has a large addressable energy spend
- Company ABC has 10 distribution centers nationwide in Texas, California, Florida and Virginia; energy costs vary based on location
- Each distribution center manages its own local energy budget.
- Energy spend related to facilities is most directly addressable
- Facilities currently account for about 67% of Distribution division energy costs
- The distribution buildings have aged significantly and no longer optimize energy usage

Energy Efficiency Portfolio

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The following projects have been included in sustainability's 3-year business plan

Project	Observations	Savings	Risk	Feasibility
LED Lighting	Distribution centers can reduce energy cost by replacing fluorescent lighting with high efficiency LED lights ✓ Lighting is 25% of total facility energy use ✓ Lights generate heat leading to increased HVAC cost ✓ Frequent bulb replacement and spare lights must be kept on hand to ensure reliability	✓ High efficiency LED lights use significant less energy ✓ Reduced maintenance cost and bulb replacement ✓ Rapid payback for most types of lighting fixtures ✓ Estimated savings of $5M		
Technology / Office Equipment	Distribution centers can reduce costs by upgrading technology, eliminating unnecessary office equipment and powering down devices when not in use ✓ PCs are left on frequently ✓ Plausible to have on more PCs than employees on shift ✓ Many cubes have individual PCs, printers, and heaters	✓ Hibernating or powering off PCs rather than using screen savers can yield additional savings ✓ Moving to network peripherals, such as printers, increases the ability to manage overall power consumption ✓ Estimated savings $500K		
HVAC	Distribution centers can reduce energy cost by performing HVAC retrofits to increase the efficiency of heating and cooling zone control.	✓ As buildings age zone dampers often stick and lead to issues with temperature comfort issues or overcooling ✓ Retrofit cost range from $1-$4 / sqft but typically have 3 year payback ✓ Estimated savings of $7M for full upgrade; $5M for minor HVAC upgrades, repairs, or retrofits		

Case Study: Portfolio Analysis

- How would you prioritize the proposed portfolio of projects?
- Which factors are most important to consider?
- Which factors would finance consider most heavily?
- What additional information would be helpful to perform a more comprehensive analysis?
- Is this a balanced portfolio (risk, feasibility, etc.)?
- Should additional projects be added or removed to optimize the risk/return?

Your Examples

Applying Finance Concepts to Your Real World Examples

Group Discussion Instructions

Share Your Project Examples: *5 min*
Everyone describe their project example with the table

Table Discussions: *10 min*
Discuss the most compelling story for your project example, including how to drive Finance value & key metrics to use

Group Debrief: *10 min*
Share with the workshop group the key learnings from the table discussion & the most helpful workshop topics

Wrap Up and Q&A

Appendix

Performance Management – Analytical Ratios

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Analytical Ratios	• Analytical ratios such as NPV & ROI are standard key metrics that are almost always applicable to any company & serves as a standard measure/benchmark

Key metrics the Finance organization uses to evaluate projects

Cost of Capital	The cost of funds used to pay for an investment. A weighted average is frequently used as businesses Finance projects with both debt & equity.
Return on Invested Capital (ROIC)	A measure of operating performance – how well a company uses capital that third parties have invested. A project's ROIC should be greater than the cost of capital.
Return on Investment (ROI)	A measure to compare individual project efficiency. ROI equals the benefit of an investment (gain less cost) divided by the cost of the investment.
Payback Period	The amount of time before the cash inflows repay the initial investment
Net Present Value (NPV)	A method to measure & compare the profitability of a project. Calculated by summing the present values of the cash inflows less the cash outflows.
Internal Rate of Return (IRR)	A method to measure profitability of a project. It is the discount rate at which the NPV equals zero. Provides a clearer benchmark of projects of different sizes.

Measurement: Return on Investment

Definition	A ratio to measure the benefit of the investment of capital. ROI is a measure of efficiency that can be used to compare multiple projects.
Analysis	• Inputs: Gain on investment; cost of investment • A high ROI means that the project has favorable returns as compared to the required capital investment

Example:

Project A costs $500,000 and has a total gain of $600,000. What is the project's ROI?

Formula:

$$\frac{\text{(Gain from investment – Cost of investment)}}{\text{Cost of Investment}}$$

$$\frac{600{,}000 - 500{,}000}{500{,}000} = \mathbf{20\%}$$

Measurement: Hurdle Rate

Definition	The **minimum rate of return** that a project must earn in order to be funded. The rate of return earned by projects with similar risk.
Analysis	• Calculated based on the company's **cost of capital** • High risk projects have **high** hurdle rates • **Project IRR > = to Hurdle Rate**

Example:

A company's hurdle rate is 10%. Which projects would be considered to be funded?

Project B: IRR = 8%

Project C: IRR = 10%

Project D: IRR = 12%

Measurement: Payback Period

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Definition

The amount of time before the **cash inflows repay the initial investment.** The discounted payback period adjusts the cash inflows for the time value of money (a dollar is worth more now than a year from now).

Analysis

- Inputs: cash inflows and cash outflows
- Shorter payback periods are preferred
  - Less risk
  - Recovered costs are available to invest in new projects sooner

Example:

Project E cost $200,000 in year 1. The cash inflows from Project E are expected to be $100,000 each year for 3 years. What is the payback period?

	Year 1	Year 2	Year 3
Cash inflow	$100,000	$100,000	$100,000
Cash outflow	($200,000)	$0	$0

Measurement: Net Present Value (1 of 3)

Definition	The sum of the discounted value of all cash inflows less all cash outflows.

Analysis	• Inputs: initial investment, cash inflows, cash outflows, discount rate
	• Higher NPV's are preferred
	  • Less risk; greater return
	  • Projects with NPV's < 0 should not be considered

Example:

Project F has $150,000 cost today and has a 10% cost of capital. The cash inflows from Project F are expected to be $100,000 for 3 years. The annual cash outflow each year is $25,000. What is the NPV of the investment?

	Year 0 (Now)	Year 1	Year 2	Year 3
Cash inflow		$100,000	$100,000	$100,000
Cash outflow	($150,000)	($25,000)	($25,000)	($25,000)
Net Cash Flows	**($150,000)**	**$75,000**	**$75,000**	**$75,000**

Measurement: Net Present Value (2 of 3)

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Step 1: Identify Cash Flows

	Year 0 (Now)	Year 1	Year 2	Year 3
Cash inflow		$100,000	$100,000	$100,000
Cash outflow	($150,000)	($25,000)	($25,000)	($25,000)
Net Cash Flows	**($150,000)**	**$75,000**	**$75,000**	**$75,000**

Step 2: Discount Cash Flows

Formula:

$$\frac{\text{Net Cash Flow}}{(1+\text{discount rate})^{\wedge}\text{year}}$$

Year 1 Example:

$$\frac{\$75{,}000}{(1+.1)^{\wedge}1}$$

	Year 0 (Now)	Year 1	Year 2	Year 3
Net Cash Flows	($150,000)	$75,000	$75,000	$75,000
Present Value	**($150,000)**	**$68,182**	**$61,983**	**$56,349**

Measurement: Net Present Value (3 of 3)

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Step 3: Sum Discounted Cash Flows

	Year 0 (Now)	Year 1	Year 2	Year 3	Total
Present Value	**($150,000)**	**$68,182**	**$61,983**	**$56,349**	**$36,514**

Step 4: Conclude on NPV

The NPV for this project is positive. If it is greater than NPV's of similar projects (with comparable risk), **management should pursue this project**.

Measurement: Internal Rate of Return (IRR)

Definition	The discount rate at which the NPV equals zero.
Analysis	• Iterative process of inputting interest rates • Measure to compare projects of different sizes

Example:

Project G costs $150,000 now and has a 10% hurdle rate. The cash inflows from Project G are expected to be $100,000 for 3 years. The annual cash outflow each year is $25,000. What is the IRR of the investment?

	Year 0 (Now)	Year 1	Year 2	Year 3
Cash inflow		$100,000	$100,000	$100,000
Cash outflow	($150,000)	($25,000)	($25,000)	($25,000)
Net Cash Flows	**($150,000)**	**$75,000**	**$75,000**	**$75,000**

Measurement: IRR (2 of 2)

Calculate NPV with different discount rates until you obtain a value of zero:

Discount Rate	NPV
20%	$7,986
23%	$853
24%	($1,402)
25%	($3,600)
30%	($13,792)

The IRR falls between 23% and 24%. Further iteration results in an IRR of approximately **23.4%. The IRR is greater than the hurdle rate of 10%.**

This value can be compared to other projects of difference sizes to gauge relative returns. If it is greater than IRR's of similar projects (with comparable risk), **management should pursue this project**.

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